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ABSTRACT

Over the past six semesters, researchers developed a project-based learning experience for an introductory Educational Psychology course. Each semester, one or two aspects of the project were varied. In the most recent semester, 44 students in 2 sections of the course worked on the project in groups. In both sections, students were provided with a grading rubric which they used to grade one another. In addition, in one of the two sections, students were taught a specific framework for how to work together as teams. Overall results suggest that the addition of the team building framework had only a moderate positive effect. However, the grading rubric had a significant positive effect on learning and engagement for both groups. An appendix contains the project description. (Author/SLD)

AERA03 Paper

**Designing a project-based learning experience for an introductory educational
psychology course: a quasi-experiment.**

By

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ABSTRACT

Over the past six semesters we have developed a project based learning experience for an introductory Educational Psychology course. Every semester we have varied one or two aspects of the project. This past semester students in two sections of the course worked on this project in groups. In both sections students were provided with a grading rubric which they used to grade one another.

Additionally, in one of the two sections we taught students a specific framework for how to work together as teams.

Overall the introduction of the team building framework only had a moderate positive effect. However, the grading rubric had a significant positive effect on learning and engagement for both groups.

INTRODUCTION

**Designing a project-based learning experience for an introductory educational
psychology course: a quasi-experiment.**

Transforming a classroom from one centered upon direct instruction/ information transmission of a subject area to one centered upon students meaningful construction of knowledge in that subject area is a gradual and difficult process. Recently, this has involved our attempts to design a project based learning experience for my introductory Educational Psychology course; one built upon the deep principles of constructivism. That is the underlying educational philosophy that learning is not a matter of passive information transmission from teacher to student but an interactive process where knowledge is constructed between teacher and students (Bruner, 1997).

In general, research on our teaching practices has centered upon the process we have gone through to make these changes, the cognitive resources required in the construction process, and on assessing the efficacy of that unit in scaffolding our students understanding of educational psychology.

To asses the relative efficacy of changes to the project we have made across and within semesters we have utilized the methodological principles of design research (Kelly, 2003;

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Brown, 1992). This involves analyzing the effects of systematic changes in the design of the research project on students learning and engagement. One major advantage of our teaching two sections of undergraduate Ed.Psych. every semester to relatively homogeneous groups of students is that we have at our disposal a naturally occurring quasi-experimental situation.

History of the project:

What has been of primary interest to us is uncovering how the project has evolved over the past five semesters from the required individual term paper with the extra-credit individual open-ended inquiry assignment into a required group problem-based mini-lesson research project.

This evolution has been the product of four factors; student feedback (responses from Likert scale and open-ended survey questions), evaluation of the quality of student papers and presentations, and our own evolving definition of inquiry learning. We have used all of the above as data to provide an empirical basis for our research and the changes we have made to the project over the past few years.

Meyerson first taught Educational Psychology as a graduate student at a large Mid Western University. At that time he lectured to classes ranging in size between 100-200 students. For the first semester he believed this sized class precluded his using any teaching strategy beside direct instruction, so he didn't try a different delivery strategy. However, based on student feedback at the end of the semester, during the second semester he decided to create an extra credit assignment for students. He decided to allow students to volunteer for an extra credit assignment to give a 15 minute presentation on any of the topics covered in the syllabus. Although only a handful of students took this opportunity, in the end he felt it was quite effective. The students who presented, as well as their classmates in the audience, gave very positive feedback on these presentations as a learning experience. This was a major step for him in moving beyond a direct instruction paradigm to guide his teaching philosophy and practice.

Therefore, when Meyerson once again had an opportunity to teach Educational Psychology this time at a medium sized Mid Western University to much smaller sized classes (only 35 students per section) he decided to incorporate a research paper and presentation into the course. He also had a number of colleagues (especially Sam Adams) who actively encouraged him to be more constructivist in his approach to teaching.

In the first semester Meyerson decided to require all students to work on a 5-7 page research paper on an Ed.Psych. topic of their choosing. He gave them the extra credit option of presenting their findings to the rest of the class. A number of students ($n=7$) chose the extra credit presentation option. These presentations were almost always quite excellent. Not only did the students enjoy giving them but their classmates enjoyed listening to them. A number of students chose the same topic for their paper/presentation (e.g. multiple intelligences). Students

had to find 4-5 articles on their topic. These changes helped develop a sense of ownership by individuals and groups of students.

In the second semester Meyerson decided to offer students the choice of either the paper or the presentation. Students had to find 2-3 articles on their topic. This was done to encourage students to become critical (as opposed to passive) consumers of research.

In the third semester Meyerson and Adams decided to require all students to work on the presentations in groups- on topics of their choice. Groups had to find 2-3 articles on their topic- We decided to limit their use of internet articles/references//citations because use of the internet actually seemed to hinder their learning basic research skills.

In the fourth semester we offered students a menu of possible topics. Additionally, we required students to find a research article on their topic and to partially grade one another on the quality (i.e. in terms of scholarship) of their research article.

The biggest change between the 4th and 5th semesters was that we narrowed the number of topics for the projects as well as focused each of the topics on specific psychological/ educational problems. We also agreed to let students use internet sources.

Another aspect of this research project that has evolved over the previous five semesters is the focus on group work. The first project was an individual research assignment. Then it became a group research activity. Currently we are working on making the project more of a cooperative learning activity. Ideally we want students to: a) become meta-cognitive of the processes involved in students working in groups, b) scaffold one another's learning as they work in the groups, and c) have students assess one another's performance. In the sixth semester very specific changes were made to the way the group work was presented, organized, and conducted. This paper analyzes the effect changes to group work aspect of the research project made during this past (sixth) semester had on the overall efficacy of the project.

Student feedback in semester five and from feedback from colleagues at the 3rd Annual Conference on the Teaching of Psychology (2002) gave us constructive ideas for how to improve the quality of the group work in semester six. Whereas grades were previously (through semester five) determined 100% by the instructor using a scoring rubric, grades for the students' projects are now determined in the following manner; 50% of grade determined by instructor, 25% determined by group members, and 25% by the rest of class.

We developed two assessment rubrics/instruments to aid in making this a uniform process for determining each of the three contributory grades that when combined constituted the overall grade. See Figures 1 & 2

Figure 1 -Instrument for Instructor and classmates to determine project grades
Educational Psychology Final Project Rating Scale

Group Topic: _____

Date:

Group Members:

Checklist

| | Great: 100 | Good: 90 | Fair: 80 | Lacking: 70 | Poor: 60 |
|---|------------|----------|----------|--------------|----------|
| Scholarship: Main ideas/issues are adequately addressed. Additional scholarly information beyond what is provided in the textbook was used to create the presentation. Sources are cited. | | | | | |
| Clarity: Main points are abundantly apparent by end of the lesson. Teaching aids are used when appropriate to provide clarity. Presentation is well organized. | | | | | |
| Usefulness: Main points relevant to educational psychology. Connections between the presentation and real issues of teaching and learning made apparent by the group. | | | | | |
| Engagement: Presentation is interesting, and sustains audiences attention. | | | | | |
| | | | | Total Score= | Grade = |

Additional Comments:

Figure 2 -Instrument for individual group members to use to determine grades for their group mates.

ED. Ψ Group Project- Peer Evaluation Form

Your name:

Date:

Your group topic:

Indicate if each group member's performance was (1) unacceptable, (2) marginal, (3) acceptable, (4) commendable, (5) exceptional in the areas of attendance, timely completion of group projects and intellectual contribution to the group. Comments to support your assessment are desirable.

| Team Member | Attendance at group meetings | Completion of group work | Overall intellectual contribution to group |
|-------------|------------------------------|--------------------------|--|
| 1. _____ | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| Comments: | | | |
| Team Member | 1 2 3 4 5 | 1 2 3 4 5 | 1 2 3 4 5 |
| 2. _____ | | | |
| Comments: | | | |

Changes in the overall group work framework/philosophy for semester six involved utilizing a general philosophical framework centered on encouraging students to see the learning value of working together in groups, and to be more meta-cognitive of the ways groups can work together effectively. It also provided students with a specific set of guidelines for how students should work together in order to help them think and act as a team as opposed to a collection of individuals. First, students were taught the value of working together. Second, they were introduced to the different roles members of groups take in order to work together effectively. These roles included; team leader, team note taker, discussion facilitator, team member, etc. Third, students were encouraged to adopt these roles into their actual group work on the research project.

Research Questions:

Overall Question across all semesters of the project: What pedagogical principles and instructional activities best maximize student engagement and learning in a project based learning experience designed for an educational psychology course?

General questions for this paper/presentation:

- What effect do the changes in the assessment procedures and group work principles have on student learning?
- What effect do the changes in the assessment procedures and group work principles have on student engagement in the project?

Specific Questions:

- Do changes in the assessment procedure increase student learning?
- Do changes in the principles governing the group work increase student learning?
- Do changes in the principles governing the group work increase student engagement in the project?

METHODS

Participants

Participants (total n=44, with 22 in each section) are undergraduates in two of the sections of Educational Psychology taught by Meyerson at a 10,000+ student mid West University. Demographically participants in both classes were comparable (middle SES, mixed-gender, white undergraduates in their late teens or early 20s).

Procedures

Both the treatment and control groups received the same instructions for the objectives of the assignment (see appendix A for a full description of the research project). Both groups also received the same grading rubric for the assignment. They were told, Grades for each presenter will be calculated in the following manner: 50% of grade for presentation and paper given to you by instructor, 25% graded by fellow group members, 25% graded by whole class for your groups overall presentation.

For the instructor and whole class portion of the grade the following criteria were used to evaluate the presentations; scholarship, clarity, usefulness, engagement (as depicted in figure 1). Each of these 4 criteria was rated on a 100 point rating scale.

Students in both groups were told to grade their fellow groupmates using the following three criterion: Attendance at group meetings, completion of group work overall intellectual contribution to group. Each student rated each of his or her groupmates on each of these criteria using a 5 point Likert scale.

In addition the treatment group was given a one hour lesson on how to work effectively in teams. This involved students in brainstorming the roles individuals assume in teams. It also involved them in a small group activity where they were asked to think outside the box.

Data sources:

Aside from the presentations, accompanying papers, and the completed grading rubrics, data on the effectiveness of the project were collected using a survey. This survey contained four Likert scale questions as well as one open-ended question. The surveys were administered to all groups at the end of the semester (See appendix B for the complete survey)

RESULTS

From the quantitative analysis:

While no significant differences were found on survey question data between the experimental and treatment groups in semester 6 there was a clear trend in the data from the two classes on all measures showing that the treatment group felt they learned more and were more engaged in the project than were students in the control group.

Here are the four survey questions:

1. I enjoyed the final project.

Strongly Disagree 1 2 3 4 5 Strongly Agree

2. I hope we do projects like this in my other courses.

Strongly Disagree 1 2 3 4 5 Strongly Agree

3. When I become a teacher I would use a project like this in my classroom.

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. I learned a lot from participating in this final project.

Strongly Disagree 1 2 3 4 5 Strongly Agree

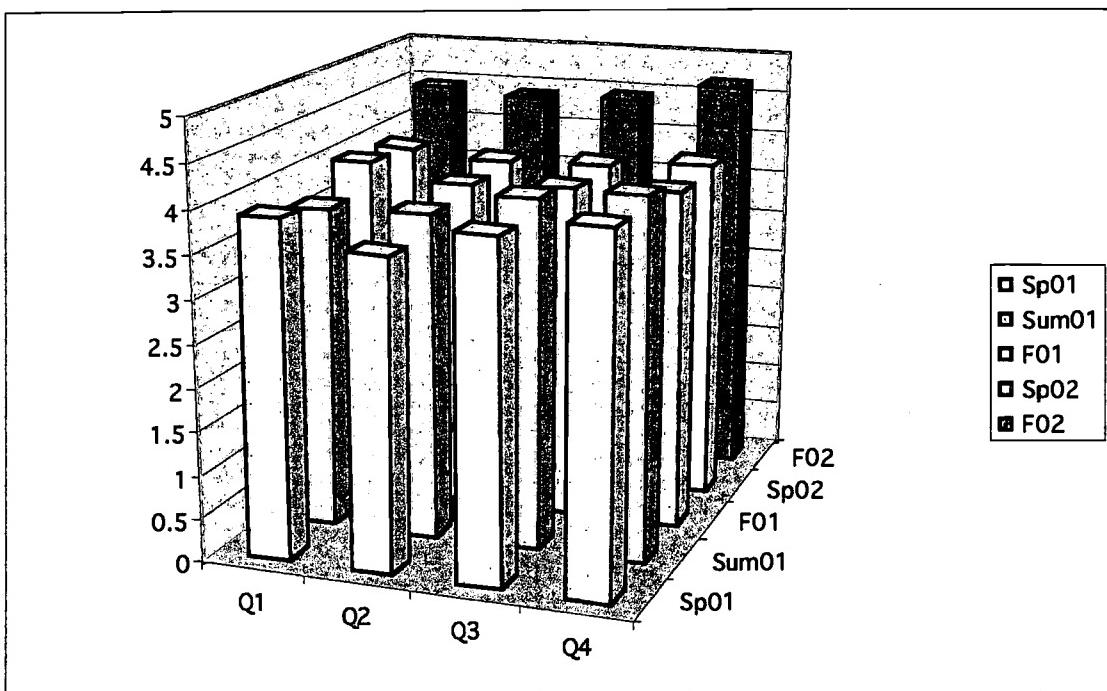
Table 1 shows the differences in survey scores between the 2 sections of the course:

Table 1

| | Treatment (N=22) | Control(N=22) |
|----------|------------------|---------------|
| Question | MEAN | MEAN |
| 1 | 4.682 | 4.318 |
| 2 | 4.636 | 4.182 |
| 3 | 4.545 | 4.409 |
| 4 | 4.773 | 4.636 |

Although none of these differences between the sections of the course this past semester are statistically significant, highly significant effects were found for changes made between semesters.

See Figure 3 for the mean differences:

Figure 3: Mean differences in scores across five semesters.

Comparing the scores of this most recent semester to any of the other semesters (or all of the previous semesters combined) yields significant differences in all cases.

For example, comparison of the mean scores of semester six to those of semester five yields the following results:

Table 3:

- For question 1

$t=-2.76, p \leq .007$

- For question 2

$t=-2.58, p \leq .01$

- For question 3

$t=-2.6, p \leq .01$

- For question 4

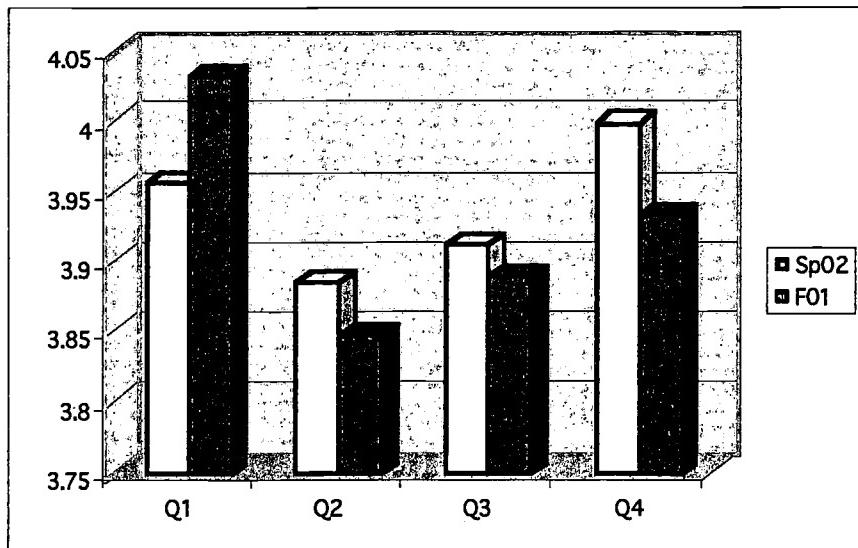
$t=-3.76, p \leq .0005$

To estimate if this was an instructional delivery effect rather than an instructor effect in the course across semesters the students' SOS (Student Opinion Survey) scores were compared across semesters. No significant differences were found.

Moreover, adding further support to the idea that these differences were a unique effect of the group work activities this past semester it was determined that the differences between any other two semesters on these four questions had never before approximated statistical significance.

For an example see Figure 4.

Figure 4: Mean differences in scores between the Fall 01 and Spring 02 semesters.



Although a visual inspection of the figure shows slight numerical differences in scores- as Table 4 shows none of these results even come close to statistical significance:

Table 4:

comparing research project survey scores of Spring 02 classes to Fall 01 classes

- For question 1

$t = -0.39$ $p \leq 0.69$

- For question 2

$t = 0.18$ $p \leq 0.86$

- For question 3

$t = 0.10$ $p \leq 0.92$

- For question 4

$t = 0.30$ $p \leq 0.76$

From the qualitative analysis:

Qualitative analysis has (so far) yielded the following results:

In terms of learning:

Twice as many students in the treatment group ($n=8$) wrote comments saying they learned a great deal from this research project compared to the control group ($n=4$).

In terms of engagement:

Whereas three students in the control group said they would prefer to work alone on such projects six of the participants in the treatment group made specific comments about how much they enjoyed working in their groups and making new friends.

DISCUSSION

Analysis of the results

Analysis of the results of the sixth semester indicate the following general conclusions:

1. Quantitatively comparing the two groups for the sixth semester there was only a moderate difference between the two in students sense of the amount they learned and how much they liked the projects . However, there were significant differences in students sense of the amount they learned and how much they liked the projects across semesters. Some treatment effect worked well this sixth semester while others didn t work. We conjecture that the way we introduced the principles of team work had only a moderate effect on the treatment group but the way we changed the assessment rubric had a positive effect on both treatment and control groups.

2. Qualitatively students in both classes realized a benefit out of the procedures for project assessment using the shared accountability/grading system. Letting the students have input into 50% of their final grade for the project gave them a sense of empowerment in terms of their own sense of how much they learned from the final project. This sense of empowerment led them to work harder on the project which in turn led them to feel more engaged.

While the results of the changes we introduced in the sixth semester are quite encouraging, we are by no means finished with the evolution of the project. We strongly believe in the power of the principles of team building. We believe these principles if properly applied will have a significant effect on student learning and engagement. As part of our next step in the course design process, we need to insure that students really are assuming the various roles in the group as the semester progresses. Furthermore, we need to reinforce in students minds the idea that role assignment in teams can be a powerful aid to the success of their research project in terms of both increased learning and engagement.

Limitations of this study

Although we obtained some surprisingly strong findings, a pre-test and post-test would add more control.

Where do we go next?

We plan on scaffolding the team building in terms of students being required to assume various group roles. We will be more active in monitoring students as they work in teams during the semester. We will institute an accountability system for role playing in the group (each student will be required to document his or her assumption of a variety of group roles).

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Appendix A

Complete Project Description

Content Experts (You are to work on this in groups of no more than 4-5):

You are to pick a topic from the textbook and prepare a 30-35 minute in-class group presentation on that topic. As a group you must turn in a 4-5 page overall summary of your presentation. All members of the group are expected to contribute substantively to the final presentation and the overall group summary.

Since this is a cooperative learning activity your grade for this assignment will in-part be based on how your group works overall, and on how you perform as an individual within the group. To help you learn to be an effective group member and to work cooperatively we will be using a specific cooperative learning approach in this class.

In terms of the specifics of the assignment, each group member must physically locate and read at least 1 unique article/book chapter that they have found in the periodical/journal section of Polk library related to that topic (make sure you use scholarly/ quality sources- be cautious when using internet sources, If you are not sure if an article is appropriate ask the instructor). Group members will then report in-class to one another on what they learned from the article/book chapter they read (Class time will be allotted for this activity and this part of the assignment will be graded by your fellow group mates). Individual group members must turn in to the instructor a copy of their article along with a one-page summary of the article (to be turned in on the same day you report on your article to your groupmates).

The one page article summary is in addition to the 4-5 page group summary (which is due the day you present). In the group summary you should discuss the overall significance of your topic (e.g. why it's relevant to teachers, parents, society etc.).

Your 4-5 page summary should include a (2-3 page) summary of the overall conclusions of research on your topic. What are the main ideas/themes of your topic?

It also should include a 1 page outline of how you have structured your presentation and what learning goals you have for the students listening to your presentation.

Finally, it should include a 1 page list of sources you have used in creating this presentation (APA style is preferred).

In the actual presentation you should:

1. Focus on the major ideas/themes of your topic (i.e. you only have 30 minutes so focus on the forest not the trees).
2. Talk about how researchers investigate your topic (i.e. tell us a little about the methods used in the articles you read).
3. Discuss the educational relevance/implication of research findings on your topic.
4. Discuss controversial/debatable aspects of the topic (don't just tell us a one sided story).
5. Try to use multiple teaching strategies (e.g. group work) not just knowledge telling.
6. Utilize multi-media (i.e. powerpoint, overheads, etc.)
7. As part of your presentation make sure you properly cite all sources.
8. Create 2 open-ended questions for class discussion on some aspect/s of your topic. (make sure you leave at least 5-10 minutes in your presentation to discuss them)
9. Create 1 multiple choice question based on your presentation.

Note- I will set aside blocks of time for you to work on your presentations in-class but you will probably need at least a couple of additional out-of-class group meetings too.

I will pass out a sign up sheet with dates and times for presentations. Sign up will be on a first come first served basis.

Here is a list of the group presentation topics:

- What is concept-learning?: p.278-289
- How can we become expert students?: p.302-309
- What are inquiry and problem based learning? p.336-339
- How can we make group work an effective tool for promoting learning? p.340-345
- What is a cognitive apprenticeship? And, how can it be used to promote learning? p.348-354
- Constructivism- Pros and Cons.(Abbeduto, p.158)
- What are strategies to encourage motivation and thoughtful learning? p.419-425
- How do we create a positive learning environment? p. 439-449
- What is the role of the teacher in the classroom? P. 494-500
- What do test scores mean?-P.525-533
- To test or not to test? P.541
- Are traditional tests useful in classroom assessment? P564
- Topic of your own choosing (must be approved by instructor)

EXTRA CREDIT:Reflection paper-on your content expert presentation-worth 5 points toward overall grade.

This is an opportunity for you to reflect upon your own teaching and learning. After your group has given its presentation you will critically reflect upon it. That is you will write a brief (3) page paper in which you: a) describe the unique strengths as a caring intellectual you brought to the presentation, b) describe the specific challenges working on this presentation presented to you as a caring intellectual , c) describe the changes you see from presentation one to presentation two, and d) discuss what you learned from giving these two presentations that you will use to improve your future teaching and learning as a caring intellectual . Remember to focus more on pedagogical and content issues rather than stylistic issues. You must use some data source (interview, surveys, video) to base your conclusions in this paper upon. **Due no later than the last day of the semester.**

Appendix B

Final Project Survey

1. I enjoyed the final project.

Strongly Disagree 1 2 3 4 5 Strongly Agree

2. I hope we do projects like this in my other courses.

Strongly Disagree 1 2 3 4 5 Strongly Agree

3. When I become a teacher I would use a project like this in my classroom.

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. I learned a lot from participating in this final project.

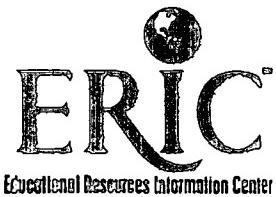
Strongly Disagree 1 2 3 4 5 Strongly Agree

Suggestions for anything you think should be changed/modified if I have students do this final project in the future?

Additional Comments?



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